

CLAIMS

What is claimed is:

- 1 1. A magnetic head, comprising:
 - 2 a sensor having an antiparallel (AP) pinned layer structure, wherein the AP
 - 3 pinned layer structure includes at least two pinned layers having magnetic
 - 4 moments that are self-pinned antiparallel to each other, the pinned layers
 - 5 being separated by an AP coupling layer; and
 - 6 a pair of compression layers positioned towards opposite track edges of the
 - 7 sensor, the compression layers providing compressive stress to the sensor.
- 1 2. A head as recited in claim 1, wherein the compression layers are constructed of
- 2 metal.
- 1 3. A head as recited in claim 1, wherein the compression layers are constructed of
- 2 rhodium.
- 1 4. A head as recited in claim 1, wherein the compression layers are constructed of
- 2 tantalum.
- 1 5. A head as recited in claim 1, wherein the compression layers are constructed of
- 2 tungsten.

1 6. A head as recited in claim 1, wherein the compression layers are constructed of a
2 dielectric material.

1 7. A head as recited in claim 1, wherein the compression layers are positioned
2 substantially outside the track edges of the sensor.

1 8. A head as recited in claim 1, wherein the compression layers are substantially
2 aligned with the sensor.

1 9. A head as recited in claim 1, further comprising hard bias layers positioned
2 towards opposite track edges of the sensor, the compression layers being
3 positioned above the hard bias layers.

1 10. A head as recited in claim 1, further comprising shield layers positioned above
2 and below the sensor, and at least one electrically insulative layer positioned
3 towards each of the compression layers for preventing conduction of electricity
4 through the compression layers from one shield layer to the other shield layer.

1 11. A head as recited in claim 1, further comprising shield layers positioned above
2 and below the sensor, and at least one electrically insulative layer positioned
3 towards each of the compression layers for preventing conduction of electricity
4 through the compression layers from the sensor to one of the shield layers.

- 1 12. A head as recited in claim 1, wherein the head forms part of a GMR head.
- 1 13. A head as recited in claim 1, wherein the head forms part of a CPP GMR sensor.
- 1 14. A head as recited in claim 1, wherein the head forms part of a CIP GMR sensor.
- 1 15. A head as recited in claim 1, wherein the head forms part of a tunnel valve sensor.
- 1 16. A magnetic head, comprising:
 - 2 a sensor having an antiparallel (AP) pinned layer structure, wherein the AP
 - 3 pinned layer structure includes at least two pinned layers having magnetic
 - 4 moments that are self-pinned antiparallel to each other, the pinned layers
 - 5 being separated by an AP coupling layer; and
 - 6 a pair of compression layers positioned towards opposite track edges of the
 - 7 sensor, the compression layers providing compressive stress to the sensor;
 - 8 wherein the compression layers are positioned substantially outside the track
 - 9 edges of the sensor.
- 1 17. A head as recited in claim 16, wherein the compression layers are constructed of
- 2 metal.

1 18. A head as recited in claim 16, wherein the compression layers are constructed of
2 rhodium.

1 19. A head as recited in claim 16, wherein the compression layers are constructed of
2 tantalum.

1 20. A head as recited in claim 16, wherein the compression layers are constructed of
2 tungsten.

1 21. A head as recited in claim 16, wherein the compression layers are constructed of a
2 dielectric material

1 22. A head as recited in claim 16, wherein the compression layers are substantially
2 aligned with the sensor.

1 23. A head as recited in claim 16, further comprising hard bias layers positioned
2 towards opposite track edges of the sensor, the compression layers being
3 positioned above the hard bias layers.

1 24. A head as recited in claim 16, further comprising shield layers positioned above
2 and below the sensor, and at least one electrically insulative layer positioned
3 towards each of the compression layers for preventing conduction of electricity
4 through the compression layers from one shield layer to the other shield layer.

- 1 25. A head as recited in claim 16, further comprising shield layers positioned above
- 2 and below the sensor, and at least one electrically insulative layer positioned
- 3 towards each of the compression layers for preventing conduction of electricity
- 4 through the compression layers from the sensor to one of the shield layers.

- 1 26. A head as recited in claim 16, wherein the head forms part of a GMR head.

- 1 27. A head as recited in claim 16, wherein the head forms part of a tunnel valve
- 2 sensor.

- 1 28. A magnetic storage system, comprising:
 - 2 magnetic media;
 - 3 at least one head for reading from and writing to the magnetic media, each head
 - 4 having:
 - 5 a sensing element having the structure recited in claim 1;
 - 6 a write element coupled to the sensor;
 - 7 a slider for supporting the head; and
 - 8 a control unit coupled to the head for controlling operation of the head.